

SYNOPSIS OF THE DISSERTATION ENTITLED " ANALYTICAL APPLICATIONS OF NEWLY SYNTHESISED THIOLIGANDS" SUBMITTED BY KUM. R.D. MADHALE FOR THE M.Phil DEGREE IN CHEMISTRY TO SHIVAJI UNIVERSITY, KOLHAPUR - 4.

The dissertation embodies the results of intensive studies of analytical applications of 5-Methyl salicylaldehyde thiosemicarbazone (5-methyl SAT) for the photometric determination of Mo(VI) and Ru(III) and application of 1-(2,4-dichlorophenyl)-4,4,6-trimethyl (1H,4H)-2-pyrimidinethiol (2,4-dichloro PTPT) to solvent extraction separation of gold (III).

Chapter-I:

It includes the description of theory of spectrophotometry. This chapter describes the laws of absorption, limitations to the applicability of Beer's law, instrumentation, working of spectrophotometer and analytical applications of spectrometry.

Chapter-II:

This chapter covers an account of the synthesis and characterisation of

- i) 5-Methyl salicylaldehyde thiosemicarbazone and
- ii) 1-(2,4-Dichlorophenyl)-4,4,6-trimethyl (1H,4H)-2-pyrimidinethiol. The broad review of the reagents is also given. These reagents form sufficiently stable complexes with metal ions and possess properties desirable for spectrophotometry. The purity of the reagents was checked from their elemental analysis and melting point.

Chapter-III:

In this chapter photometric procedure for determination of Mo(VI) using 5-Methyl SAT is presented. Molybdenum(VI) reacts with 5-Methyl SAT to form red complex with the sharp maximum absorption at 510 nm when the alcoholic mixture, 3M in HCl is heated on water bath for 20 minutes, the absorption of which is measured at 510 nm against the reagent blank. The reagent does not require the addition of separate reducing agent like SnCl_2 , ascorbic acid or thiourea and also the presence of Cu(II) ion or Fe(III) ion to prevent over reduction of molybdenum. Interference study is made and it is observed that many foreign ions are tolerated. The method is simple and sensitive. The method has been applied for the determination of molybdenum in steel sample 31 b and 33d.

Chapter-IV:

The study of photometric determination of ruthenium(III) is made in this chapter. Ruthenium (III) reacts with 5-Methyl SAT in hot alcoholic solution (20 min heating) at 6M-HCl to form a green complex, the absorption of which is measured at 590 nm against the reagent blank. Effect of all the parameters and interference study is made.

Chapter-V :

This chapter is devoted to describe the use of 2,4-dichloro PTPT as an extractant for Au(III). The chloroform solution of 2,4-dichloro PTPT extracts the colourless complex of Au(III) quantitatively in a single extraction in 5-10 sec at room temperature and is determined with stannous chloride method. The recovery of Au(III) is quantitative and the results are reproducible.

Every chapter from 2 to 5 opens up with a brief but upto date literature survey of reagents in tabular form reported for photometric and extractive determination of the respective elements. An attempt has been made to study the methods described critically as ~~xxxxxx~~ regards the sensitivity, accuracy and precision. The proposed ligands appear very versatile and promising as an extractants and photometric reagents.